



# Navy-Marine Corps Strike-Fighter Shortfall: Background and Options for Congress

**Christopher Bolkcom**  
Specialist in Military Aviation

April 10, 2009

Congressional Research Service

7-5700

[www.crs.gov](http://www.crs.gov)

RS22875

| Report Documentation Page  |                                    |                                     |   | Form Approved<br>OMB No. 0704-0188                  |                                 |
|--|------------------------------------|-------------------------------------|---|---|---------------------------------|
| Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number. |                                    |                                     |   |   |                                 |
| 1. REPORT DATE<br><b>10 APR 2009</b>   |                                    | 2. REPORT TYPE                      |   | 3. DATES COVERED<br><b>00-00-2009 to 00-00-2009</b> |                                 |
| 4. TITLE AND SUBTITLE<br><b>Navy-Marine Corps Strike-Fighter Shortfall: Background and Options for Congress</b>  |                                    |                                     |   | 5a. CONTRACT NUMBER                                 |                                 |
|  |                                    |                                     |   | 5b. GRANT NUMBER                                    |                                 |
|  |                                    |                                     |   | 5c. PROGRAM ELEMENT NUMBER                          |                                 |
| 6. AUTHOR(S)   |                                    |                                     |   | 5d. PROJECT NUMBER                                  |                                 |
|  |                                    |                                     |   | 5e. TASK NUMBER                                     |                                 |
|  |                                    |                                     |   | 5f. WORK UNIT NUMBER                                |                                 |
| 7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)<br><b>Congressional Research Service, Library of Congress, 101 Independence Ave SE, Washington, DC, 20540-7500</b>  |                                    |                                     |   | 8. PERFORMING ORGANIZATION REPORT NUMBER            |                                 |
| 9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)  |                                    |                                     |   | 10. SPONSOR/MONITOR'S ACRONYM(S)                    |                                 |
|  |                                    |                                     |   | 11. SPONSOR/MONITOR'S REPORT NUMBER(S)              |                                 |
| 12. DISTRIBUTION/AVAILABILITY STATEMENT<br><b>Approved for public release; distribution unlimited</b>  |                                    |                                     |   |   |                                 |
| 13. SUPPLEMENTARY NOTES  |                                    |                                     |   |   |                                 |
| 14. ABSTRACT   |                                    |                                     |   |   |                                 |
| 15. SUBJECT TERMS  |                                    |                                     |   |   |                                 |
| 16. SECURITY CLASSIFICATION OF:  |                                    |                                     | 17. LIMITATION OF ABSTRACT<br><b>Same as Report (SAR)</b> | 18. NUMBER OF PAGES<br><b>9</b>                     | 19a. NAME OF RESPONSIBLE PERSON |
| a. REPORT<br><b>unclassified</b>   | b. ABSTRACT<br><b>unclassified</b> | c. THIS PAGE<br><b>unclassified</b> |   |   |                                 |

## Summary

Members of Congress this year have expressed concern about a projected inventory shortfall in Navy and Marine Corps strike-fighters. Some industry sources believe the shortfall is likely to be much larger than Navy projections. Options for addressing the shortfall include extending strike-fighter service lives and increasing planned procurement of strike-fighters. This report will be updated as events warrant.

## **Contents**

|   |   |
|---|---|
| Background .....  | 1 |
| Navy and Marine Corps Strike-Fighters.....                  | 1 |
| Strike-Fighter Procurement .....                            | 1 |
| The Projected Shortfall .....                               | 2 |
| Reported Unsolicited Proposal from Boeing.....              | 3 |
| Issues for Congress .....                                   | 3 |
| Size of Strike-Fighter Shortfall.....                       | 3 |
| Potential Operational Implications of Shortfall .....       | 4 |
| Options for Congress .....                                  | 4 |
| Legislative Activity for FY2009 .....                       | 5 |
| FY2009 Defense Authorization Bill (H.R. 5658/S. 3001) ..... | 5 |

## **Figures**

|  |   |
|--|---|
| Figure 1. Projected Strike-Fighter Shortfall ..... | 3 |
|--|---|

## **Tables**

|  |   |
|--|---|
| Table 1. Procurement of Navy and Marine Corps Strike-Fighters..... | 2 |
|--|---|

## **Contacts**

|                                  |   |
|----------------------------------|---|
| Author Contact Information ..... | 6 |
|----------------------------------|---|

## Background

### Navy and Marine Corps Strike-Fighters

The Navy and Marine Corps, which are both part of the Department of the Navy (DON), each operate hundreds of strike-fighters, which are tactical aircraft that can conduct both air-to-ground (i.e., strike) and air-to-air (i.e., fighter) operations. Strike-fighters constitute the majority of the aircraft in each of the Navy's 10 active-duty aircraft carrier air wings (CVWs)<sup>1</sup>—of the 70 or more aircraft typically embarked on a Navy aircraft carrier, 44 are strike-fighters. Strike-fighters also constitute a significant portion of the Marine Corps' three active-duty Marine air wings (MAWs).<sup>2</sup> Some Marine Corps strike-fighters are assigned to Navy CVWs.

The principal strike-fighter operated by the Navy and Marine Corps is the F/A-18 Hornet/Super Hornet, manufactured by Boeing. The older A through D models of the F/A-18 are called Hornets, while the newer, larger, and more capable E and F models are called Super Hornets. The Navy operates more than 600 Hornets and Super Hornets, while the Marine Corps operates more than 200 Hornets, plus roughly 130 AV-8B Harriers, which are short takeoff, vertical landing (STOVL) attack aircraft.<sup>3</sup> In coming years, the Navy plans to retire its Hornets and shift to a combination of Super Hornets and F-35 Lightning II Joint Strike Fighters (JSFs), while the Marine Corps plans to retire both its Hornets and Harriers and shift to strike-fighter force composed entirely of F-35s. The carrier-capable version of the F-35 intended for the Navy is designated the F-35C, while the STOVL version intended for the Marine Corps is designated the F-35B.<sup>4</sup>

### Strike-Fighter Procurement

The first F/A-18E/Fs were procured in FY1997. A total of 493 are currently planned for procurement, with the final 22 to be procured in FY2012. Industry sources state that, under this schedule, suppliers of long-leadtime items for the F/A-18-E/F would begin to shut down starting in October 2010.<sup>5</sup> FY2009 is the fifth year of a planned five-year (FY2005-FY2009) multiyear procurement (MYP) arrangement for procuring 164 F/A-18E/Fs and 53 EA-18Gs.<sup>6</sup> A previous MYP arrangement covered F/A-18E/Fs procured in FY2000-FY2004. A total procurement of 680 F-35 Bs and Cs is planned, including 320 F-35Bs and 360 F-35Cs, though the exact mix within the 680 total could change.<sup>7</sup> **Table 1** shows actual (FY2007-FY2008), requested (FY2009), and

---

<sup>1</sup> In the abbreviation CVW, CV means aircraft carrier and W means air wing. In addition to the 10 active-duty CVWs, the Navy also operates one reserve tactical air wing.

<sup>2</sup> In addition to the three active-duty MAWs, the Marine Corps operates one reserve MAW.

<sup>3</sup> As of April 2008, DON operated a total of 964 Hornets and Super Hornets, including 334 Navy Hornets, 311 Navy Super Hornets, 217 Marine Corps Hornets, and 102 additional Hornets in a shared Navy-Marine Corps repair pipeline.

<sup>4</sup> The version of the F-35 being procured for the Air Force is designated the F-35A.

<sup>5</sup> Source: Briefing from industry officials to CRS on April 10, 2008.

<sup>6</sup> The EA-18G Growler is an electronic warfare variant of the F/A-18 that is being procured as a replacement for the Navy's aging EA-6B Prowler carrier-based electronic warfare planes.

<sup>7</sup> For more on the F-35 program, see CRS Report RL30563, *F-35 Lightning II Joint Strike Fighter (JSF) Program: Background, Status, and Issues*, by Christopher Bolcom.

planned (FY2010-FY2013) procurement of F/A-18E/Fs, F-35Cs, and F-35Bs under DON's proposed FY2009 budget.

**Table 1. Procurement of Navy and Marine Corps Strike-Fighters**  
(funding figures in millions of then-year dollars, rounded to nearest million)

|                                     | FY07    | FY08    | FY09    | FY10    | FY11    | FY12    | FY13    |
|-------------------------------------|---------|---------|---------|---------|---------|---------|---------|
| <b>F/A-18E/F Super Hornet (USN)</b> |         |         |         |         |         |         |         |
| Quantity                            | 37      | 24      | 23      | 18      | 17      | 22      | 0       |
| Total proc. cost                    | \$2,766 | \$2,106 | \$1,920 | \$1,631 | \$1,581 | \$1,735 | \$200   |
| Unit proc. cost                     | \$75    | \$88    | \$83    | \$91    | \$93    | \$79    | —       |
| <b>F-35 Lightning II</b>            |         |         |         |         |         |         |         |
| Quantity (total)                    | 0       | 6       | 8       | 18      | 19      | 40      | 42      |
| <b>F-35C (USN)</b>                  | 0       | 0       | 0       | 4       | 6       | 15      | 17      |
| <b>F-35B (USMC)</b>                 | 0       | 6       | 8       | 14      | 13      | 25      | 25      |
| Total proc. cost <sup>a</sup>       | \$124   | \$1,224 | \$1,896 | \$3,565 | \$3,376 | \$5,640 | \$5,613 |
| Unit proc. cost <sup>a</sup>        | —       | \$204   | \$237   | \$198   | \$178   | \$141   | \$134   |

**Source:** FY2009 DON budget submission.

a. Total and unit procurement cost figures shown are for combined total of F-35Cs and F-35Bs.

## The Projected Shortfall

DON's inventory of strike-fighters currently falls short of the number that Navy officials state is required to fully support requirements for CVWs and MAWs, and the Navy is projecting that this shortfall will grow in coming years. The Navy projects that if no additional action is taken, a DON strike-fighter shortfall of about 15 aircraft in FY2009, to 50 aircraft in FY2010, and to a peak of 243 aircraft in FY2018. The projected strike-fighter shortfall is hoped to decrease after FY2018, but the DON will still have a gap of over 50 strike fighters in 2025. At its peak in FY2018, the projected DON strike-fighter shortfall will be 129 Navy strike-fighters and 114 Marine Corps strike-fighters.<sup>8</sup>

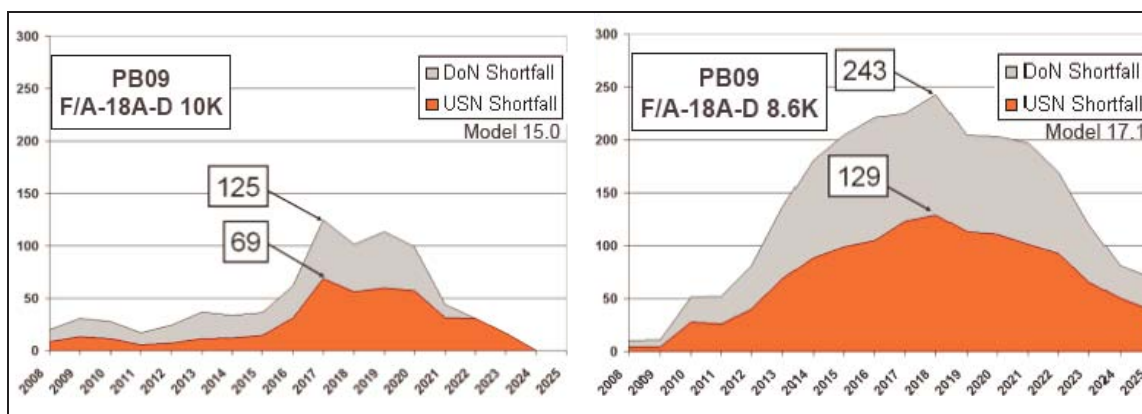
This projected strike-fighter shortfall is twice as big as the Navy's earlier projected shortfall of 125 aircraft.<sup>9</sup> (See Figure 1, below) The earlier estimate was the Navy's, "most optimistic" projection because it assumed, among other things, that the service lives of Hornets could be extended from the current planning figure of 8,000 flight hours to 10,000 flight hours. (The Hornets were originally built for service lives of 6,000 hours, a goal that was later changed to 8,000 hours.) The Navy now believes that it can extend the life of the Hornets to 8,600 flight hours within their current budget, by conducting High-Fly-Hour (HFH) inspections. If legacy F/A-18s are retired when they reach their 8,600 flight-hour life span, the DoN strike-fighter shortfall would be reflected in the chart on the right of Figure 1 below rather than the chart on the

<sup>8</sup> *Strike Fighter Shortfall Update*. Briefing provided by Department of the Navy to HASC Staff. March 13, 2009.

<sup>9</sup> Navy briefings provided to CRS on April 24, 2008, and industry briefing papers provided to CRS on April 10 and 22, 2008.

left side of Figure 1. Achieving a full 10,000 flight hour life-span is projected to cost an additional \$22 million per aircraft and exceeds the Navy's current funding.<sup>10</sup>

**Figure 1. Projected Strike-Fighter Shortfall**  
2008 Projection(L) and 2009 Projection (R)



Source: Strike Fighter Shortfall Update OpCit

Another assumption inherent in the Navy's 2008 projection of a 125 strike-fighter shortfall is that F-35 procurement will increase from year to year as currently planned and eventually reach a sustained rate of 50 aircraft per year. The Navy's 2009 projection of a 243 strike-fighter shortfall *also* assumes this F-35 procurement plan. If F-35 procurement is delayed or if the rate of production is less than assumed—say for example, 35 aircraft per year vs. 50 aircraft per year—then the projected strike-fighter shortfall would grow.

## Reported Unsolicited Proposal from Boeing

Boeing reportedly has made an unsolicited offer to the Navy to begin procuring an improved version of the F/A-18E/F featuring upgraded avionics. Under this proposal, the Navy could forego procuring F-35Cs while waiting for an even more advanced strike-fighter design that could become available for procurement around 2024.<sup>11</sup>

## Issues for Congress

### Size of Strike-Fighter Shortfall

One issue for Congress to consider is the potential size of the shortfall. Key factors to consider include the likelihood that the Navy will be able to extend Hornet lives to 10,000 hours, the likelihood that the F-35 will achieve its scheduled IOC, and the likelihood that DON will achieve a sustained F-35 production rate of 50 aircraft per year. Concerning the development schedule for

<sup>10</sup> Strike Fighter Shortfall Update OpCit, and emails between HASC staff and CRS.

<sup>11</sup> See David A. Fulghum, "Boeing Plans Sixth Generation Fighters Along With Block 3 Super Hornet," *Aerospace Daily & Defense Report*, January 30, 2008; and Chris Amos, "A Super Duper Hornet," *Defense News*, April 7, 2008.

the F-35, a March 2008 Government Accountability Office (GAO) report on the F-35 program states, “Three independent defense offices separately concluded that ... the [F-35 program] development schedule is likely to slip from 12 to 27 months.”<sup>12</sup>

## Potential Operational Implications of Shortfall

A second issue for Congress to consider are the potential operational implications of the strike-fighter shortfall for either conflict situations or for meeting demands for day-to-day forward deployments of DON strike-fighters for purposes of regional deterrence and reassurance. The shortfall could lead to a reduction in the number of strike-fighter squadrons available for service, a reduction in the number strike fighters in each squadron, or both.

## Options for Congress

Options for Congress to address the projected DON strike-fighter shortfall include but are not limited to the following, some of which could be combined:

- request further information and analysis from DON and/or industry concerning the potential size of the shortfall;
- fund service life extensions of Hornets to as much as 10,000 hours, if such extensions prove feasible and cost effective;
- increase planned procurement of F/A-18E/Fs in coming years;
- increased planned procurement of F-35s in coming years; and
- expedited procurement of a new long-range bomber.

Regarding the third option, F/A-18E/F procurement could be continued for a few years beyond FY2012, until procurement of F-35s for DON begins to increase to higher levels. Alternatively, F/A-18E/F procurement could be continued for a longer period of time, so that a mix of substantial numbers of both F/A-18E/Fs and F-35s is procured for a certain number of years. A third option would be to begin procuring improved F/A-18E/Fs in lieu of procuring F-35s, while waiting for an even more advanced strike-fighter to become available for procurement around 2024. Supporters of increased F/A-18E/F procurement could argue that the F/A-18E/F is a capable aircraft, that it is less expensive to procure than the F-35, and that procuring the established F/A-18E/F design poses less risk of cost growth than procuring the new F-35 design.

Regarding the fourth option, supporters of increased F-35 procurement could argue that the F-35, as a newer design, is more capable than the F/A-18E/F, and thus more able to counter potential future military challenges, such as those that might be posed by improved Chinese military forces;<sup>13</sup> that the cost difference between the F-35 and the F/A-18E/F is not as great as it appears on first inspection because the procurement cost of the F-35 includes the cost for a number of ancillary pieces of equipment that are purchased separately for the F/A-18E/F; and that reducing

---

<sup>12</sup> Government Accountability Office, *Joint Strike Fighter[:] Recent Decisions by DOD Add to Program Risks*, GAO-08-388, March 2008, summary page.

<sup>13</sup> See CRS Report RL33153, *China Naval Modernization: Implications for U.S. Navy Capabilities—Background and Issues for Congress*, by Ronald O'Rourke.



or eliminating the F-35C buy for the Navy could reduce economies of scale in producing F-35s and thereby increase the cost of F-35s that are built for the Marine Corps, the Air Force, and foreign buyers.

DON officials, in addition to studying the feasibility of extending Hornet service lives to 10,000 hours, reportedly are considering the option of procuring an additional 50 to 282 F/A-18s and the option of either accelerating or slowing down planned production of F-35s.<sup>14</sup> The Navy reportedly would consider using a third MYP arrangement for F/A-18E/Fs procured in FY2010-FY2014, should F/A-18E/F procurement be increased.<sup>15</sup> The Navy reportedly is not interested in the option of skipping production of F-35Cs.<sup>16</sup>

Regarding the fifth option, CVWs and long-range bombers share important attributes. Neither requires in-theater bases and thus offer potential for prompt strikes in a crisis. Therefore, an increased inventory of long-range bombers could, in some ways, make up for a shortfall in DON strike fighters. Of course, long-range bombers have other attributes that do not mirror DON strike fighters, such as higher cost and lower potential survivability. This means that replacing DON strike fighters with long-range bombers would change the overall capabilities of DOD airpower, either negatively or positively, depending on the context. Current DOD plans call for fielding a new long range bomber by 2018, and bomber advocates have argued that a new bomber could be fielded in a more timely manner.<sup>17</sup>

## Legislative Activity for FY2009

### FY2009 Defense Authorization Bill (H.R. 5658/S. 3001)

Section 124 of H.R. 5658 as reported by the **House Armed Services Committee** would require the Secretary of Defense to submit a report on F/A-18E/F and EA-18G procurement for FY2010 through FY2015, including comparative costs and benefits of using annual versus multiyear procurement to procure the aircraft, and the Secretary's recommendation as to whether Congress should authorize multiyear procurement for the aircraft. The provision would also authorize, subject to the availability of appropriations, the Secretary of the Navy to obligate up to \$100 million of the amount authorized for F/A-18E/F and EA-18G procurement for use in cost reduction initiatives in FY2009. The committee's report (H.Rept. 110-652 of May 16, 2008) discusses Section 124 on pages 141-142. Authorization conferees supported this provision.

The **Senate Armed Services Committee**, in its report (S.Rept. 110-335 of May 12, 2008), expressed concern about the projected DON strike-fighter shortfall, and its belief that the Navy's estimate of the size of the shortfall may be based on questionable assumptions. The committee stated that it believes that a multiyear procurement of additional F/A-18E/Fs may be helpful in

---

<sup>14</sup> Vago Muradian, "U.S. Navy Struggles With 'Fighter Gap,'" *Defense News*, April 7, 2008. See also Philip Ewing, "Fearing Fighter Gap, Navy Mulls New Jet Buy," *NavyTimes.com*, March 6, 2008.

<sup>15</sup> See, for example, the short items entitled "Closing The Gap" and "...Up Front Cost," in the April 14, 2008 issue of *Defense Daily*.

<sup>16</sup> David A. Fulghum, Navy Wants F-35C and Perhaps More Super Hornets," *Aerospace Daily & Defense Report*, March 26, 2008: 1-2.

<sup>17</sup> See CRS Report RL34406, *The Next Generation Bomber: Background, Oversight Issues, and Options for Congress*, by Anthony Murch.

reducing the shortfall, and that the Navy should explore all available options in determining how to address the shortfall. The committee expressed concern that a failure to establish the conditions for a multiyear procurement of F/A-18E/Fs could reduce the savings of such a procurement. The committee stated that it remains supportive of the F-35, and that Navy plans for procuring F-35Cs should not be affected if the Navy decides to pursue an F/A-18E/F multiyear contract. (Pages 123-124) Concerned by testimony that it received from DOD regarding aircraft shortfalls, the committee required (Sec. 171) DOD to annually submit a long-term plan for procuring tactical aircraft so that Congress can make rational judgments about which aircraft programs to fund. Authorization conferees supported this provision.

## **Author Contact Information**

Christopher Bolkcom  
Specialist in Military Aviation  
cbolkcom@crs.loc.gov, 7-2577